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**west virginia** department of environmental protection

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Office of Oil and Gas  
601 57th Street SE  
Charleston, WV 25304  
(304) 926-0450  
(304) 926-0452 fax

Earl Ray Tomblin, Governor  
Randy C. Huffman, Cabinet Secretary  
[www.dep.wv.gov](http://www.dep.wv.gov)

October 30, 2013

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-8510067, issued to NOBLE ENERGY, INC., is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.

James Martin  
Chief

Operator's Well No: PEN2AHS  
Farm Name: KIESSLING, TERRY & HELEN  
**API Well Number: 47-8510067**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 10/30/2013

**Promoting a healthy environment.**

## PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

### CONDITIONS

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1. The Office of Oil and Gas has approved your permit application, which includes your addendum. Please be advised that the addendum is part of the terms of the well work permit, and will be enforced as such. The Office of Oil and Gas must receive a copy of all data collected, and submitted in a timely fashion, but no later than the WR35 submittal.
2. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE regarding this proposed activity.
3. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
4. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
5. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
6. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
7. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
8. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the

## **PERMIT CONDITIONS**

particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.

9. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.

85 10067

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
WELL WORK PERMIT APPLICATION

1) Well Operator: Noble Energy, Inc. 494501907 085 Clay Pennsboro  
Operator ID County District Quadrangle

2) Operator's Well Number: PEN2AHS Well Pad Name: PEN2

3 Elevation, current ground: 1074.85 Elevation, proposed post-construction: 1075.4

4) Well Type: (a) Gas ☒ Oil ☐ Underground Storage ☐  
Other ☐  
(b) If Gas: Shallow ☒ Deep ☐  
Horizontal ☒

5) Existing Pad? Yes or No: No

6) Proposed Target Formation(s), Depth(s), Anticipated Thicknesses and Associated Pressure(s):

Target-Marcellus, Depth- 6262-6324; Thickness- 62"; Pressure- 4174 # psi

7) Proposed Total Vertical Depth: 6314'

8) Formation at Total Vertical Depth: Marcellus

9) Proposed Total Measured Depth: 15753

10) Approximate Fresh Water Strata Depths: 454'

11) Method to Determine Fresh Water Depth: Closest well & Seneca Technology data base

12) Approximate Saltwater Depths: 1244'

13) Approximate Coal Seam Depths: no coal

14) Approximate Depth to Possible Void (coal mine, karst, other): none

15) Does proposed well location contain coal seams directly overlying or adjacent to an active mine? If so, indicate name and depth of mine: no

16) Describe proposed well work: Drill the vertical depth to the Marcellus at an estimated total vertical depth of approximately 6314 feet.

Drill Horizontal leg - stimulate and produce the Marcellus Formation.

Should we encounter a unanticipated void we will install a minimum of 20' of casing below the void but not more than 50' set a basket and grout to surface.

17) Describe fracturing/stimulating methods in detail:

The stimulation will be multiple stages divided over the lateral length of the well. Stage spacing is dependent upon engineering design. Slickwater fracturing technique will be utilized on each stage using sand, water, and chemicals.

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18) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres):

SEP 23 2013  
8.43

19) Area to be disturbed for well pad only, less access road (acres):

8.0

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Environmental Protection

*Drill 8.21.13*

85 10067

20)

**CASING AND TUBING PROGRAM**

<b>TYPE</b>	<b><u>Size</u></b>	<b><u>New or Used</u></b>	<b><u>Grade</u></b>	<b><u>Weight per ft.</u></b>	<b><u>FOOTAGE: For Drilling</u></b>	<b><u>INTERVALS: Left in Well</u></b>	<b><u>CEMENT: Fill -up (Cu. Ft.)</u></b>
Conductor	20"	N	LS	52	40'	40'	GTS
Fresh Water	13 3/8"	N	J-55	54.5	579'	579'	CTS
Coal							
Intermediate	9 5/8"	N	HCK-55 BTC	36.0	5410'	5410'	CTS
Production	5 1/2"	N	HCP-110 TXP BTC	20.0	15753'	15753'	14.8 ppg class A tail slurry to inside intermediate casing
Tubing							
Liners							

<b>TYPE</b>	<b><u>Size</u></b>	<b><u>Wellbore Diameter</u></b>	<b><u>Wall Thickness</u></b>	<b><u>Burst Pressure</u></b>	<b><u>Cement Type</u></b>	<b><u>Cement Yield</u></b>
Conductor	20"	26"	0.25	2730	Grout to Surface	Grout to Surface
Fresh Water	13 3/8"	17.5"	.380	2730	Type 1	1.18
Coal						
Intermediate	9 5/8"	12.25"	.352	3520	Class A	1.19
Production	5 1/2"	8.75/8.5"	.361	12,640	Class A	1.27
Tubing						
Liners						

**PACKERS**

Kind:				
Sizes:				RECEIVED Office of Oil and Gas
Depths Set:				SEP 23 2013

*David*  
8-21-13



= 85 10067

21) Describe centralizer placement for each casing string.

Conductor - No centralizers used. Fresh Water/Surface-

Bow spring centralizers every 3 joints to surface. Intermediate - Bow spring

centralizers on every joint to KOP, one every third joint from KOP to 100' from Surface.

Production - Rigid bow spring every third joint from KOP to TOC, rigid bow spring every joint to KOP.

22) Describe all cement additives associated with each cement type.

Conductor - 1.15% CaCl<sub>2</sub>.

Fresh Water - 1.15% CaCl<sub>2</sub>. Coal - 1.15% CaCl<sub>2</sub>, 0.6% Gas migration control additive, 0.5% fluid loss additive, 0.4% Salt tolerant dispersant, and 0.3% defoamer. Intermediate - 10.0% BWOW NaCl, 0.2% BWOB Anti-foam, 0.3% BWOW Dispersant, 0.4% BWOB Cement retarder. Production: 2.6% Cement extender, 0.7% Fluid Loss additive, 0.5% high temperature retarder, 0.2% friction reducer.

23) Proposed borehole conditioning procedures.

Conductor - The hole is drilled w/ air and casing is run in air. Apart from insuring

the hole is clean via air circulation at TD, there are no other conditioning procedures. Fresh Water -The hole is drilled w/air and casing is run in air. Once casing is on bottom, the hole is filled w/ KCl water and a minimum of one hole volume is circulated prior to pumping cement. Coal - The hole is drilled w/air and casing is run in air. Once casing is at setting depth, the hole is filled w/ KCl water and a minimum of one hole volume is circulated prior to pumping cement. Intermediate - Once surface casing is set and cemented Intermediate hole is drilled either on air or SOBM and filled w/ KCl water once filled w/ KCl water once drilled to TD. The well is conditioned with KCl circulation prior to running casing. Once casing is at setting depth, the well is circulated a minimum of one hole volume prior to pumping cement. Production - The hole is drilled with synthetic oil base mud and once at TD

the hole is circulated at a drilling pump rate for at least three hours. Once the torque and drag trends indicate the hole is clean the drilling BHA is pulled and casing is run. Once on bottom w/ casing the hole is circulated a minimum of one hole volume prior to pumping cement.

\*Note: Attach additional sheets as needed.

*JMK*  
8.21.13

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STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS

85 10067

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Noble Energy, Inc. OP Code 494501907

Watershed (HUC 10) North Fork of Hughs River HUC 10 / Bonds Creek Quadrangle Pennsboro

Elevation 1074.85 County Ritchie District Clay

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes \_\_\_\_\_ No \_\_\_\_\_

Will a pit be used for drill cuttings? Yes \_\_\_\_\_ No X

If so, please describe anticipated pit waste: closed loop-no utilization of a pit

Will a synthetic liner be used in the pit? Yes \_\_\_\_\_ No X If so, what ml.? \_\_\_\_\_

Proposed Disposal Method For Treated Pit Wastes:

- ☐ Land Application
- ☐ Underground Injection ( UIC Permit Number \_\_\_\_\_ )
- ☒ Reuse (at API Number at next anticipated well )
- ☒ Off Site Disposal (Supply form WW-9 for disposal location)
- ☐ Other (Explain \_\_\_\_\_)

Will closed loop system be used? yes

Drilling medium anticipated for this well? Air, freshwater, oil based, etc. Air/water based mud through intermediate string then SOBM

-If oil based, what type? Synthetic, petroleum, etc. Synthetic

Additives to be used in drilling medium? Please see attached list

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. \_\_\_\_\_

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) \_\_\_\_\_

-Landfill or offsite name/permit number? Please see attached list

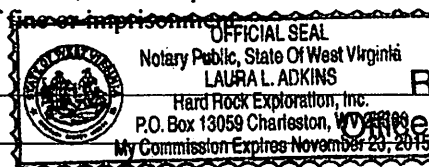
I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment.

Company Official Signature \_\_\_\_\_

Company Official (Typed Name) Dee Swiger

Company Official Title Regulatory Analyst



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Subscribed and sworn before me this 22nd day of August, 2013  
Laura L. Adkins Notary Public

My commission expires November 23, 2015

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PEN2CHS

Operator's Well No. \_\_\_\_\_

**Noble Energy, Inc.**Proposed Revegetation Treatment: Acres Disturbed 11.2 Prevegetation pH \_\_\_\_\_Lime 2 to 3 Tons/acre or to correct to pH \_\_\_\_\_Fertilizer (10-20-20 or equivalent) 500 lbs/acre (500 lbs minimum)Mulch Hay or Straw at 2 Tons/acre

## Seed Mixtures

Seed Type	Area I lbs/acre
Tall Fescue	40
Ladino Clover	5

Seed Type	Area II lbs/acre
Tall Fescue	40
Ladino Clover	5

Attach:  
Drawing(s) of road, location, pit and proposed area for land application.

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: \_\_\_\_\_

Comments: \_\_\_\_\_

Title: Oil and Gas Inspector

Date: \_\_\_\_\_

Field Reviewed?

( ☒ ) Yes( ☐ ) NoRECEIVED  
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## Water Management Plan: Primary Water Sources



WMP-01512

API/ID Number: 047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

### Important:

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

**DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.**

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at [DEP.water.use@wv.gov](mailto:DEP.water.use@wv.gov).

**APPROVED OCT 28 2013**

### Source Summary

WMP-01512

API Number:

047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

## Purchased Water

● Source **Ohio River @ Select Energy** Pleasants Owner: **Select Energy**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	11,000,000	500,000	39.346473	-81.338727

☒ Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999998 Ohio River Station: Racine Dam

Max. Pump rate (gpm): **1,680** Min. Gauge Reading (cfs): **7,216.00** Min. Passby (cfs)

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: <http://www.erh.noaa.gov/ohrfc//flows.shtml>

● Source **West Virginia American Water - Weston Water Treatme** Lewis Owner: **West Virginia American Water**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	11,000,000	500,000	-	-

☒ Regulated Stream? Stonewall Jackson Dam Ref. Gauge ID: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Max. Pump rate (gpm): **0** Min. Gauge Reading (cfs): **170.57** Min. Passby (cfs)

DEP Comments:

● Source **Glenville Utility** Gilmer Owner: **Glenville Utility**

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
9/15/2013	9/15/2014	11,000,000	10,000	-	-

☐ Regulated Stream? Burnsville Dam Ref. Gauge ID: 3155000 LITTLE KANAWHA RIVER AT PALESTINE, WV

Max. Pump rate (gpm): **0** Min. Gauge Reading (cfs): **303.75** Min. Passby (cfs)

DEP Comments:



## Source Detail

WMP-01512

API/ID Number: 047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

Source ID: 27103 Source Name: Ohio River @ Select Energy  
Select Energy

Source Latitude: 39.346473

Source Longitude: -81.338727

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 County: Pleasants

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Total Volume from Source (gal): 11,000,000

Max. Pump rate (gpm): 1,680

Max. Simultaneous Trucks:

Max. Truck pump rate (gpm)

☐ Endangered Species? ☒ Mussel Stream?

☐ Trout Stream? ☐ Tier 3?

☒ Regulated Stream? Ohio River Min. Flow

☐ Proximate PSD?

☒ Gauged Stream?

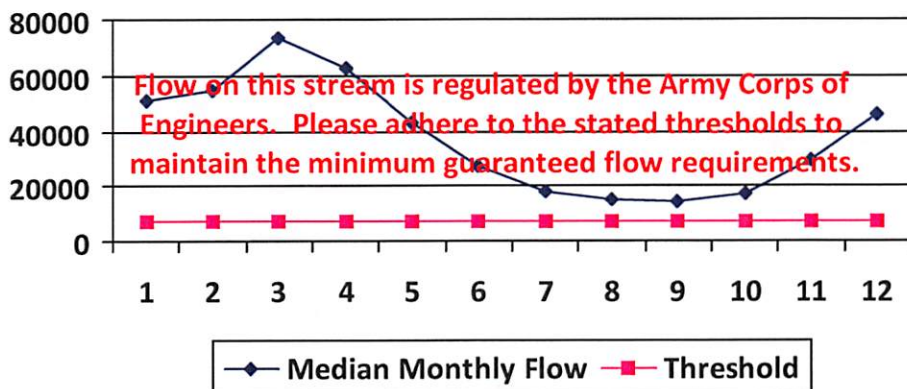
Reference Gaug 9999998 Ohio River Station: Racine Dam

Drainage Area (sq. mi.) 25,000.00

Gauge Threshold (cfs): 7216

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	50,956.00	-	-
2	54,858.00	-	-
3	73,256.00	-	-
4	62,552.00	-	-
5	43,151.00	-	-
6	27,095.00	-	-
7	17,840.00	-	-
8	14,941.00	-	-
9	14,272.00	-	-
10	17,283.00	-	-
11	29,325.00	-	-
12	46,050.00	-	-

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs): -

Upstream Demand (cfs): 0.00

Downstream Demand (cfs): 0.00

Pump rate (cfs): 3.74

Headwater Safety (cfs): 0.00

Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): -

Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

## Source Detail

WMP-01512

API/ID Number: 047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

Source ID: 27104 Source Name: West Virginia American Water - Weston Water Treat  
West Virginia American Water

Source Latitude: -

Source Longitude: -

HUC-8 Code: 5020002

Drainage Area (sq. mi.): 104.83

County: Lewis

Anticipated withdrawal start date: 9/15/2013

Anticipated withdrawal end date: 9/15/2014

Total Volume from Source (gal): 11,000,000

Max. Pump rate (gpm): 0

Max. Simultaneous Trucks:

Max. Truck pump rate (gpm)

☐ Endangered Species? ☒ Mussel Stream?

☐ Trout Stream? ☐ Tier 3?

☒ Regulated Stream? Stonewall Jackson Dam

☒ Proximate PSD? Weston WTP

☒ Gauged Stream?

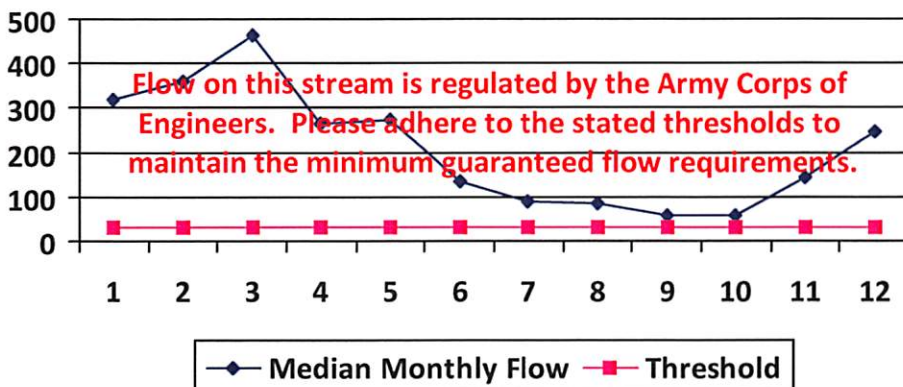
Reference Gaug: 3061000 WEST FORK RIVER AT ENTERPRISE, WV

Drainage Area (sq. mi.): 759.00

Gauge Threshold (cfs): 234

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	321.23	-	-
2	361.67	-	-
3	465.85	-	-
4	266.43	-	-
5	273.47	-	-
6	137.03	-	-
7	88.78	-	-
8	84.77	-	-
9	58.98	-	-
10	57.83	-	-
11	145.12	-	-
12	247.76	-	-

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs): -

Upstream Demand (cfs): 24.32

Downstream Demand (cfs): 0.00

Pump rate (cfs): 0.00

Headwater Safety (cfs): 8.08

Ungauged Stream Safety (cfs): 0.00

Min. Gauge Reading (cfs): -

Passby at Location (cfs): -

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.



## Source Detail

WMP-01512

API/ID Number:

047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

Source ID: 27105

Source Name

Glenville Utility

Source Latitude: -

Glenville Utility

Source Longitude: -

HUC-8 Code:

5030203

Drainage Area (sq. mi.):

385.94

County:

Gilmer

Anticipated withdrawal start date:

9/15/2013

Anticipated withdrawal end date:

9/15/2014

Total Volume from Source (gal):

11,000,000

☒ Endangered Species?

☒ Mussel Stream?

☐ Trout Stream?

☐ Tier 3?

☐ Regulated Stream?

Burnsville Dam

Max. Pump rate (gpm):

0

☐ Proximate PSD?

Max. Simultaneous Trucks:

☒ Gauged Stream?

Max. Truck pump rate (gpm)

Reference Gaug

3155000

LITTLE KANAWHA RIVER AT PALESTINE, WV

Drainage Area (sq. mi.)

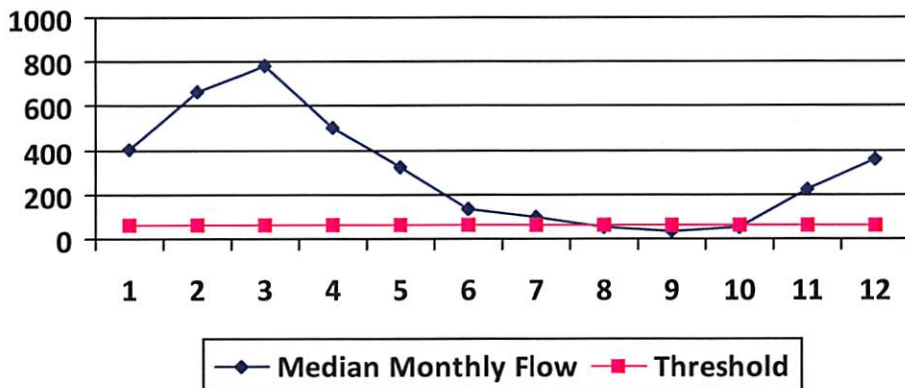
1,516.00

Gauge Threshold (cfs):

243

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	407.80	77.33	331.59
2	669.98	77.33	593.76
3	785.33	77.33	709.12
4	505.51	77.33	429.29
5	324.07	77.33	247.85
6	132.12	77.33	55.90
7	99.89	77.33	23.68
8	56.28	77.33	-19.94
9	35.11	77.33	-41.11
10	52.89	77.33	-23.32
11	223.44	77.33	147.23
12	363.54	77.33	287.32

### Water Availability Profile



### Water Availability Assessment of Location

Base Threshold (cfs):

61.86

Upstream Demand (cfs):

0.00

Downstream Demand (cfs):

0.00

Pump rate (cfs):

0.00

Headwater Safety (cfs):

15.47

Ungauged Stream Safety (cfs):

0.00

Min. Gauge Reading (cfs):

303.75

Passby at Location (cfs):

-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.



## Water Management Plan: Secondary Water Sources



WMP-01512

API/ID Number

047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

### Important:

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

### Lake/Reservoir

Source ID:	27106	Source Name	Bonds Creek Site No. 1 (WV08503)		Source start date:	9/15/2013
					Source end date:	9/15/2014
Source Lat:	39.316142	Source Long:	-80.98423	County	Ritchie	
Max. Daily Purchase (gal)		Total Volume from Source (gal):	11,000,000			
DEP Comments:	Location also known as Tracy Lake or Bonds Creek Lake					

WMP-01512

API/ID Number

047-085-10067

Operator:

Noble Energy, Inc

PEN2AHS

**Important:**

For each proposed secondary water source identified in your water management plan (i.e., groundwater well, lake/reservoir, recycled frac water, multi-site impoundment, out-of-state source), DEP makes no estimation of the availability of water. These sources may prove to be unsuitable water supplies. Please review the following notes:

- For groundwater supply wells, DEP recommends that the operator contact the local health department prior to drilling any new well; and reminds the operator that all drinking water wells within 1,500 feet of a water supply well shall be flow- and quality-tested by the operator at the request of the drinking well owner prior to operation of the water supply well.
- For each proposed multi-site impoundment water source identified in your water management plan (if applicable), DEP will review the withdrawal limits established in the referenced Water Management Plan for current suitability and provide to the operator these limits for each identified intake. Note that withdrawal limits may be modified as necessary based on changing demands upon that water supply.

**Multi-site impoundment**

Source ID:	27107	Source Name	FLG Tank Pad		Source start date:	9/15/2013
					Source end date:	9/15/2014
Source Lat:	39.335467	Source Long:	-80.001958	County	Ritchie	
Max. Daily Purchase (gal)		Total Volume from Source (gal):	11,000,000			
DEP Comments:						

The intake identified above has been defined in a previous water management plan. The thresholds established in that plan govern this water management plan unless otherwise noted.

Reference: WMP-1438

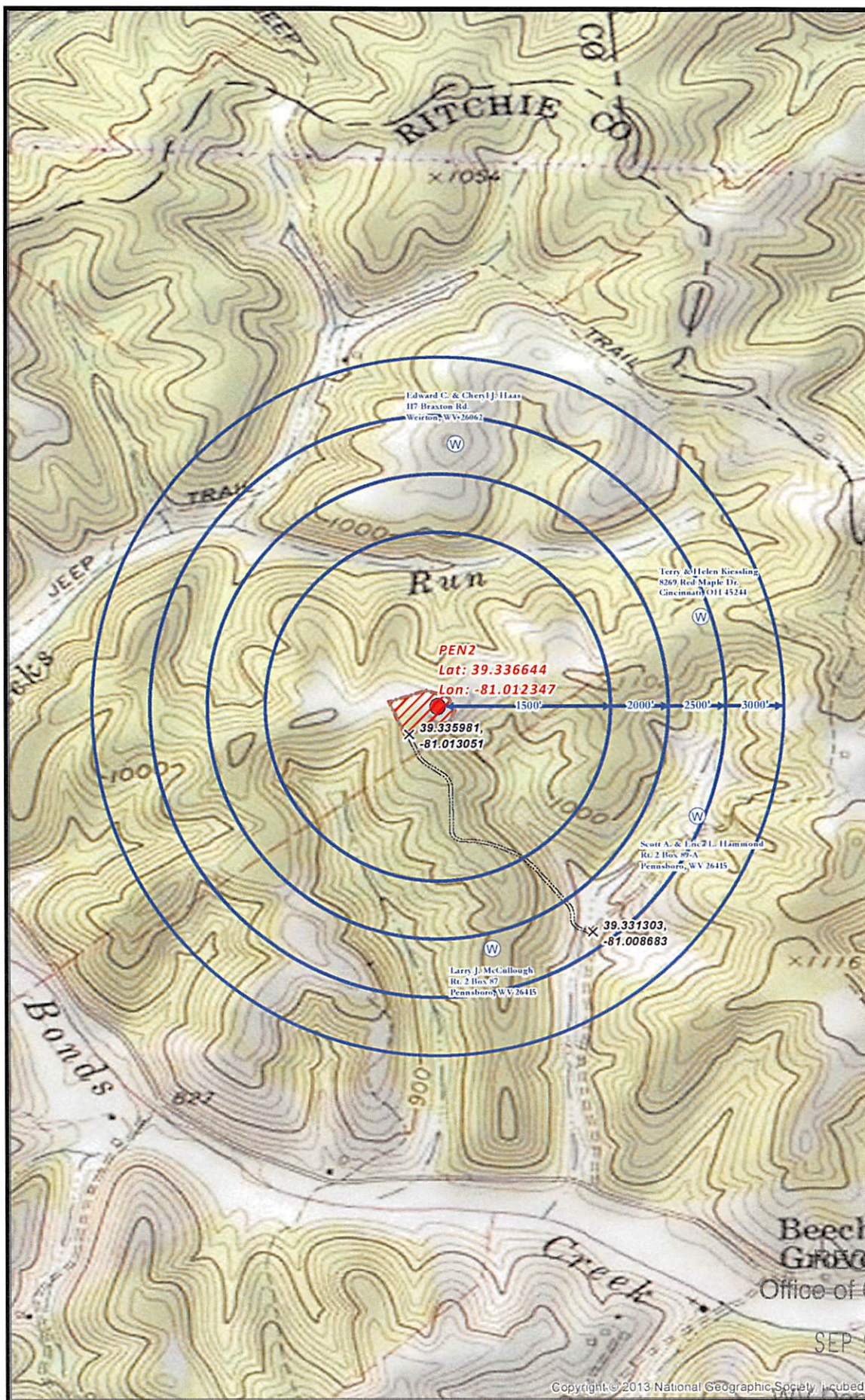
**Recycled Frac Water**

Source ID:	27108	Source Name	Various		Source start date:	9/15/2013
					Source end date:	9/15/2014
Source Lat:		Source Long:		County		
Max. Daily Purchase (gal)		Total Volume from Source (gal):	11,000,000			
DEP Comments:	Sources include, but are not limited to, the PEN1 and PEN2 well pads.					



plat spotted

85 10067

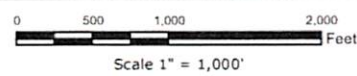
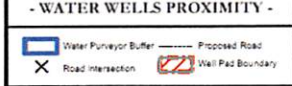


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Office of Oil and Gas

SEP 23 2013

Department of  
Environmental Protection

**PENS2 SITE SAFETY PLAN**  
- WATER WELLS PROXIMITY -



Projection: NAD\_1983\_StatePlane\_Virginia\_North\_FIPS\_4701  
Units: Feet US

**noble energy**

Disclaimer: All data is licensed for use by Noble Energy Inc. use only.

Author  
Christopher Glover  
6/6

Document Path: G:\Denver\GIS\Denver\Projects\District\_30\Appalachia\MXDs\ENSR\Permitting\Pennsboro\PEN2\B30\_PA\_WV\_PEN2\_Water\_Wells.mxd



Well is located on topo map 13,993' feet south of Latitude: 39° 22' 30"

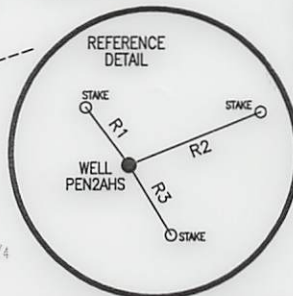


NOTES:

1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.
5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
6. It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

LEGEND

- TOPO MAP POINT
- WELL
- ALL ARE POINTS UNLESS OTHERWISE NOTED.
- WATER SOURCE
- LEASE NUMBER BASED ON ATTACHED WW-6A1
- MINERAL TRACT BOUNDARY
- PARCEL LINES
- WELL REFERENCE
- PROPOSED HORIZONTAL WELL
- ROAD
- STREAM CENTER LINE
- WELLS WITHIN 3000'
- EXISTING WELLS
- PLUGGED WELLS



LINE	BEARING	DISTANCE
R1	N 36°42'29" W	150.58'
R2	N 68°16'50" E	297.00'
R3	S 30°53'03" E	170.55'
R4	N 57°21'14" W	1797.26'
R5	N 18°18'09" W	1832.09'
R6	N 16°47'53" E	1677.36'

SURFACE HOLE LOCATION (SHL)  
UTM 17-NAD83  
N:4354126.44  
E:498907.68  
NAD27, WV NORTH  
N:308267.25  
E:1572112.77  
LAT/LON DATUM-NAD83  
LAT:39.336562  
LON:-81.012675

APPROX. LANDING POINT  
UTM 17-NAD83  
N:4353610.85  
E:498528.24  
NAD27, WV NORTH  
N:306596.14  
E:1570839.36  
LAT/LON DATUM-NAD83  
LAT:39.331916  
LON:-81.017077

BOTTOM HOLE LOCATION (BHL)  
UTM 17-NAD83  
N:4351723.38  
E:500165.07  
NAD27, WV NORTH  
N:300312.57  
E:1576107.27  
LAT/LON DATUM-NAD83  
LAT:39.314910  
LON:-80.998085

**Blue Mountain Inc.**  
11023' MASON DIXON HIGHWAY  
BURTON, WV 26562  
PHONE: (304) 662-6486

FILE #: PEN2AHS

DRAWING #: PEN2AHS

SCALE: 1" = 2000'

MINIMUM DEGREE  
OF ACCURACY: 1/2500

PROVEN SOURCE  
OF ELEVATION: U.S.G.S. MONUMENT  
THOMAS 1498.81'

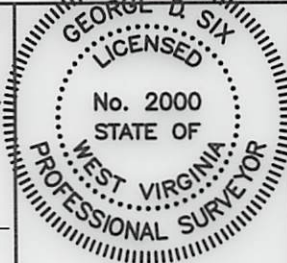
I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS  
PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND  
BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY  
LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY  
THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed:

*George D. Six*

R.P.E.:

L.L.S.: P.S. No. 2000



PLACE SEAL HERE

(+) DENOTES LOCATION OF WELL ON  
UNITED STATES TOPOGRAPHIC MAPS  
WVDEP  
OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25304



DATE: OCTOBER 15, 2013

OPERATOR'S WELL #: PEN2AHS

API WELL #: 47 85 10067  
STATE COUNTY PERMIT

Well Type: ☐ Oil ☐ Waste Disposal ☒ Production ☐ Deep  
☒ Gas ☐ Liquid Injection ☐ Storage ☒ Shallow

WATERSHED: NORTH FORK HUGHES RIVER ELEVATION: 1081.91±'

COUNTY/DISTRICT: RITCHIE / CLAY QUADRANGLE: ELLENBORO, WV 7.5'

SURFACE OWNER: TERRY & HELEN KIESSLING ACREAGE: 79.242±

OIL & GAS ROYALTY OWNER: SEE ATTACHED WW-6A1 ACREAGE: 714.306±

DRILL ☒ CONVERT ☐ DRILL DEEPER ☐ REDRILL ☐ FRACTURE OR STIMULATE ☐  
PLUG OFF OLD FORMATION ☐ PERFORATE NEW FORMATION ☐ PLUG & ABANDON ☐  
CLEAN OUT & REPLUG ☐ OTHER CHANGE ☐ (SPECIFY):

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 6,314± TMD: 15,753±

WELL OPERATOR NOBLE ENERGY, INC. DESIGNATED AGENT STEVEN M. GREEN  
Address 333 TECHNOLOGY DRIVE, SUITE 116 Address 500 VIRGINIA STREET EAST, UNITED CENTER SUITE 590  
City CANONSBURG State PA Zip Code 15317 City CHARLESTON State WV Zip Code 25301